

10 said recesses and the other one of said first and second extensions corresponding with a
A3 corresponding one of said indentations to retain said power module on said heat sinking
member and to facilitate heat transfer during operation of said power module; and

wherein each said spring clip pair exerts a substantially equal force to retain said power
module on said heat sinking member, whereby a substantially liquid proof seal may be formed
between said power module and said heat sinking member.

REMARKS

This amendment is in response to the Office Action mailed on August 15, 2000, wherein
Claims 1-11 were rejected. Claims 1, 4 and 10 have been amended, Claim 12 has been added,
and Claims 1-12 remain pending.

Objections to the Specification

On page 2 of the Office Action, the specification was objected to as failing to provide
clear support for the claim terminology. Specifically, the term "heat sinking member" does
not appear in the specification. Applicants have amended the specification to include the term
"heat sinking member" on page 3 of the specification. The term does not constitute new
matter, as the term was used in the claims.

Claim Rejections Under 35 U.S.C §112

On page 2 of the Office Action, Claim 4 was rejected under 35 U.S.C §112, second
paragraph, as being indefinite. Applicants have amended claim 4 to remove the clarity
rejections.

Claim Rejections Under 35 U.S.C § 102 and 103

On page 2 of the Office Action, Claim 10 was rejected under 35 U.S.C § 102 (b) as
being anticipated by Paterson. The Examiner stated that Paterson in Figures 1-3 discloses the
present claimed invention. On page 3 of the Office Action, Claim 11 was rejected under 35
U.S.C §103 as being unpatentable over Paterson in view of Jackson et al. or Wolgemuth et al.

The Examiner stated that Paterson discloses all the claimed features of the invention with the exception of the sealing member. The Examiner further stated that Jackson et al. and Wolgemuth et al. in Figure 2 and Figure 3, respectively, disclose that it is known to have a sealing member between a power module and a heat sinking member for the purpose of directly contacting the power module with cooling fluid. On page 4 of the Office Action, Claims 1-9 were rejected under 35 U.S.C §103 as being unpatentable over Wolgemuth et al. in view of Kwak. The Examiner stated that Wolgemuth et al. in Figures 1-4 discloses all the claimed features of the invention with the exception of spring clips in recesses and indentations. The Examiner further stated that Kwak in Figures 2 and 7 discloses it is known to have C-shaped spring clips in recesses and indentations for the purpose of securing a power module to a heat sinking member and it would have been obvious to employ in Wolgemuth et al. C-shaped spring clips in recesses and indentation for the purpose of securing a power module to a heat sinking member as disclosed in Kwak.

Applicants have amended Claims 1 and 10 to better describe the present claimed invention. Claim 1 now includes the limitation that each spring clip exerts a substantially equal force or pressure to retain said power module on said heat sinking member to form a coolant proof seal, and Claim 10 includes the limitation of generating a substantially consistent pressure across the power module and the heat sinking member with the plurality of spring clips. The present claimed invention is focused on attaching a power module to a heat sinking member receptive to cooling flow and forming a seal between the power module and the heat sinking member to prevent coolant leakage by generating a consistent force or pressure across the power module and heat sinking member.

Paterson discloses only a pair of cooling clips opposed from each other that generate only a single point force on either side of the cooling apparatus and integrated circuit, as disclosed in Figures 1-3 and column 3, lines 62-64. These single point forces will not generate a consistent pressure across the seal between the cooling apparatus and the integrated circuit. Thus, Paterson does not teach or suggest the present claimed invention of Claim 10. Furthermore, the combination of Paterson, Jackson et al, and Wolgemuth et al does not teach or suggest the present claimed invention of Claim 10. Accordingly, Claim 10 should be in condition for allowance.

not
claim
used

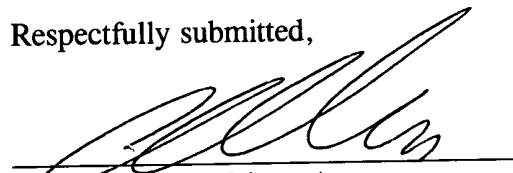
Referring to Claim 1, the Examiner was correct in stating that Wolgemuth et al does not disclose the spring clips, recesses and indentations of Claim 1. Wolgemuth utilizes threaded fasteners in a cooling apparatus. Kwak utilizes clip-type clamp springs for preventing chip position deviation, as disclosed in the abstract and column 3, lines 14-16. Kwak, similar to Paterson, discloses only a pair of cooling clips opposed from each other that generate only a single point force on either side of chip. These single point forces will not generate a consistent pressure across the seal between the cooling apparatus and the integrated circuit. Kwak is also completely silent with respect to coupling a power module to a heat sinking member receptive to coolant flow, as the primary purpose of the clips of Kwak is to prevent chip deviation and not to provide a coolant seal. There would be no motivation to combine Wolgemuth et al. and Kwak, as Kwak is completely silent with respect to providing a coolant seal. Accordingly, Claim 1 should be in condition for allowance.

Claims 1 and 10 should be in condition for allowance and Claims 2-11 which depend, directly or indirectly, from Claim 1 should also be in condition for allowance.

Conclusion

The entire Office Action dated August 15, 2000 has been carefully reviewed, and this response is submitted as being fully responsive thereto. In view of the preceding remarks, Applicants respectfully submit that Claims 1-12 are in condition for allowance and respectfully request such action at the Examiner's earliest convenience. If the Examiner believes that personal contact would be advantageous to the disposition of this case, he is requested to call the undersigned at his earliest convenience.

Respectfully submitted,



Christopher DeVries - Attorney
Reg. No. 44,654
Telephone: 313-665-4969

CD:plul